

Delivery of Sprint-2

DATE	18 November 2022
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PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES

Code for Data Transfer from Sensors

```
#include <WiFi.h>                                // library for wifi
#include <PubSubClient.h>                        // library for MQTT
#include <LiquidCrystal_I2C.h> LiquidCrystal_I2C
lcd(0x27, 20, 4);

//          credentials of IBM Accounts _____ -

#define ORG "ktymlx"                            // IBM organisation id
#define DEVICE_TYPE "new"                      // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "09876"                     // Device ID mentioned in ibm watson iot platform
#define TOKEN "Kamesh@2002"                   // Token

//          customise above values _____ -

char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server name
char publishTopic[] = "iot-2/evt/data/fmt/json"; char
topic[] = "iot-2/cmd/led/fmt/String"; // cmd Represent type and command is test format of strings
char authMethod[] = "usetoken-auth"; // authentication method
char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id

// _____

WiFiClient wifiClient;                          // creating instance for wificlient
PubSubClient client(server, 1883, wifiClient);

#define ECHO_PIN 12
#define TRIG_PIN 13 float
dist;

void setup()
{
  Serial.begin(115200);
  pinMode(LED_BUILTIN, OUTPUT);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  //pir pin pinMode(4, INPUT);

  //ledpins pinMode(23,
  OUTPUT); pinMode(2,
  OUTPUT); pinMode(4,
  OUTPUT); pinMode(15,
  OUTPUT);
```

```

lcd.init(); lcd.backlight(); lcd.setCursor(1,
0); lcd.print(""); wifiConnect();
mqttConnect();
}

```

```

float readcmCM()
{
digitalWrite(TRIG_PIN, LOW);
delayMicroseconds(2); digitalWrite(TRIG_PIN,
HIGH); delayMicroseconds(10);
digitalWrite(TRIG_PIN, LOW); int duration =
pulseIn(ECHO_PIN, HIGH); return
duration * 0.034 / 2;
}

```

```

void loop()
{

```

```

  lcd.clear();

```

```

  publishData(); delay(500);
  if (!client.loop())
  {

```

```

    mqttConnect();
  }
}

```

```

//function call to connect to IBM

```

```

/*_____retrieving to cloud_____*/

```

```

void wifiConnect()
{

```

```

  Serial.print("Connecting to ");
  Serial.print("Wifi");

```

```

  WiFi.begin("Wokwi-GUEST", "", 6);

```

```

  while (WiFi.status() != WL_CONNECTED)
  {

```

```

    delay(500);
    Serial.print(".");
  }

```

```

  Serial.print("WiFi connected, IP address: ");

```

```

  Serial.println(WiFi.localIP());
}

```

```

void mqttConnect()
{

```

```

  if (!client.connected())
  {

```

```

    Serial.print("Reconnecting MQTT client to ");

```

```

    Serial.println(server); while

```

```

    (!client.connect(clientId, authMethod, token))
    {

```

```

      Serial.print("."); delay(500);
    }

```

```

    initManagedDevice(); Serial.println();
  }
}

```

```

void initManagedDevice()
{

```

```

  if (client.subscribe(topic))
  {

```

```

    Serial.println("IBM subscribe to cmd OK");
  }
}

```

```

    else
    {
        Serial.println("subscribe to cmd FAILED");
    }
}
void publishData()
{
    float cm = readcmCM();

    if(digitalRead(34)                                //PIR motion detection
    {
        Serial.println("Motion
        Detected");    Serial.println("Lid
        Opened"); digitalWrite(15, HIGH);
    }
    else
    {
        digitalWrite(15, LOW);
    }

    if(digitalRead(34)== true)
    {
        if(cm <= 100)                                //Bin level detection
        {
            digitalWrite(2, HIGH);
            Serial.println("High Alert!!!,Trash bin is about to be full");
            Serial.println("Lid Closed"); lcd.print("Full! Don't use"); delay(2000);
            lcd.clear();          digitalWrite(4,      LOW);
            digitalWrite(23, LOW);
        }
        else if(cm > 150 && cm < 250)
        {
            digitalWrite(4, HIGH);
            Serial.println("Warning!! ,Trash is about to cross 50% of bin level"); digitalWrite(2,
            LOW);
            digitalWrite(23, LOW);
        }
        else if(cm > 250 && cm <=400)
        {
            digitalWrite(23, HIGH); Serial.println("Bin is
            available"); digitalWrite(2,LOW);
            digitalWrite(4, LOW);
        }
        delay(10000); Serial.println("Lid Closed");
    }
    else
    {
        Serial.println("No motion detected");
    }
}

if(cm <= 100)
{
    digitalWrite(21,HIGH);
    String payload = "{ \"High Alert!!\" : \"\"";
    payload += cm; payload
    += "left\" }";
    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload); if (client.publish(publishTopic, (char*) payload.c_str())) // if data is uploaded to cloud successfully,prints publish
    ok or prints publish failed
    {
        Serial.println("Publish OK");
    }
}

```

```

}
}
if(cm <= 250)
{
digitalWrite(22,HIGH);
String payload = "{\\\"Warning!!\\\":\\\"";
payload += dist; payload += \"left\\\"}";
Serial.print(\"\\n\");
Serial.print(\"Sending distance: \"); Serial.println(cm); if(client.publish(publishTopic,
(char*) payload.c_str()))
{
Serial.println(\"Publish OK\");
}
else
{
Serial.println(\"Publish FAILED\");
}
}

float inches = (cm / 2.54); //print on LCD lcd.setCursor(0,0); lcd.print(\"Inches\"); lcd.setCursor(4,0);
lcd.setCursor(12,0); lcd.print(\"cm\"); lcd.setCursor(1,1); lcd.print(inches, 1); lcd.setCursor(11,1);
lcd.print(cm, 1); lcd.setCursor(14,1); delay(1000); lcd.clear();
}

```

Connection Diagram

